

WHAT IS CLAIMED IS:

1. An ink-jet recording sheet comprising a support and a colorant receiving layer disposed on the surface of the support, wherein

the colorant receiving layer is a layer obtained by cross-linking and hardening a coated layer obtained by coating a coating solution including inorganic fine particles, a water-soluble resin and a boron compound, and

wherein the cross-linking and hardening is performed by applying a solution including a metal compound and having a pH of 8 or higher to the coated layer or a coated film at a time selected from the following:

(1) at the same time as coating the coating solution;

(2) during drying of the coated layer formed by coating the coating solution and before the coated layer shows a falling rate of drying; or

(3) after a coated layer formed by coating the coating solution is dried to form the coated film.

2. An ink-jet recording sheet according to claim 1, wherein the metal compound is a zirconium compound.

3. An ink-jet recording sheet according to claim 1, wherein the inorganic fine particles are gas phase method silica

having an average primary particle diameter of 20 nm or smaller, and the water-soluble resin is a polyvinyl alcohol.

4. A method for preparing an ink-jet recording sheet including a support and a colorant receiving layer disposed on the surface of the support, the method comprises:

coating a coating solution including inorganic fine particles, a water-soluble resin and a boron compound on the surface of the support to form a coated layer; and

cross-linking and hardening the coated layer to form a colorant receiving layer;

wherein the cross-linking and hardening is performed by applying a solution containing a metal compound and having a pH of 8 or higher to the coated layer or a coated film at a time selected from the following:

(1) at the same time as coating the coating solution;

(2) during drying of the coated layer formed by coating the coating solution and before the coated layer shows a falling rate of drying; or

(3) after the coated layer formed by coating the coating solution is dried to form the coated film.

5. A method according to claim 4, wherein the metal compound is a zirconium compound.

6. A method according to claim 4, wherein the inorganic fine particles are gas phase method silica having an average primary particle diameter of 20 nm or smaller, and the water-soluble resin is a polyvinyl alcohol.

7. A method according to claim 6, wherein an amount of the gas phase method silica is at least 90% by mass with respect to the whole inorganic fine particles, and an amount of the polyvinyl alcohol is at least 90% by mass with respect to the entire water-soluble resin.

8. A method according to claim 6, wherein a ratio of the gas phase method silica included to the polyvinyl alcohol included is in the range of 1.5:1 to 10:1.

9. A method according to claim 6, wherein the boron compound is included in the coating solution at a mass ratio of 0.05 to 0.50 relative to the water-soluble resin.

10. A method according to claim 4, wherein the boron compound is at least one of borax, boric acid and boric acid salt.

11. A method according to claim 4, wherein a pH of the coating solution is 5.0 or lower, and a pH of the solution

containing the metal compound and having a pH of 8 or higher  
is 9.0 or higher.